



EDITORIALE

LEADER

by

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AN ODD COUPLE: OUTLOOK ON GLOBAL RISKS AND MEMORY EXERCISE ABOUT ENGINEERING GEOLOGY

The Global Risk Report 2024 (GRR 2024) is a 124-page document that was presented during the 54th World Economic Forum Annual Meeting, held in Davos on 15–19 January 2024. The report describes the results of a Global Risks Perception Survey (GRPS), which gathered responses from 1500 subject-matter experts worldwide. In particular, the report gives an overview of each type of global risk over three timeframes (current, two years, and ten years) with a view to providing decision-makers with useful insights to tackle current crises and plan future strategies.

The most challenging and alarming risks arise in the following areas: geopolitics, with several conflicts occurring in many countries of the world; climate, with a growing number of extreme events, and climate change, with a definitely increasing trend; technology, which is experiencing an incredible acceleration, in all sectors, of the opportunities offered by innovation; and, finally, demography, with expanding mass migrations, involving millions and millions of human beings, and caused above all by environmental disasters and wars.

The resulting global picture is extremely complex, fragmented, and uncertain, to the extent that reference has been made to a “planetary turning point”.

In this climate of deep uncertainty and difficulty in outlining reliable future scenarios, I would like to deal with a theme that was much debated during the Forum: Artificial Intelligence (AI) and, specifically, “Generative AI”, with all the expectations, but also concerns about its possible misuses or abuses.

In this regard, the GRR 2024 clearly states that an “*unchecked proliferation of increasingly powerful, general-purpose AI technologies will radically reshape economies and societies over the coming decade – for better and for worse*”.

Indeed if, on the one hand, there will be unquestionable benefits in many sectors, some quite different from others (e.g. health care, education, environment), on the other hand, advanced AI might bring about more social risks. Moreover, new and unpredictable risks might originate from the so-called “self-

improving generative AI models that are handed increasing control over the physical world, triggering large-scale changes to socioeconomic structures.”

This is why, according to the GRPS 2024, the consequences of AI technologies are a new entry in the list of the top 10 risks, reflecting the following major concerns: a) misinformation and disinformation; b) job loss and displacement; c) criminal use and cyberattacks; d) bias and discrimination; e) use in critical decision-making by both organisations and states; and f) AI’s integration into weaponry and warfare.

All this is particularly important if we consider that, to date, the precautionary principle (prudence in the face of uncertainty) has largely not been applied in the development of AI, as regulators erred on the side of innovation.

However, rapidly evolving development of and reliance on advanced machine intelligence is outpacing our ability to adapt to and to understand the technology itself (the “Black Box Problem”), as well as to create regulatory safeguards (the “Pacing Problem”), with regulation playing catch up to the technology. The speed of advances, depth of market power, and strategic importance of the industry will continue to challenge the appetite and regulatory capacity of governance institutions. Downstream risks could endanger political systems, economic markets and global security, as well as stability.

These considerations inevitably lead me to address one last big issue, i.e. the risks that might arise in the coming years and that were the focus of intense debates during the Forum. I am referring to the so-called big match of elections in 2024, which will involve roughly 50% of the world population. Citizens from geopolitically crucial areas, such as the United States, India, Indonesia, Belarus, Iran, Russia, Taiwan, the United Kingdom, and the European Union, will go to the polls.

Actually, out of the 71 countries reported in the Economist Intelligence Unit’s Index of Democracy, only 43 will have fully free and democratic elections, including the 27 EU member countries, whereas the other 28 do not meet the basic require-

ments for free and fair elections.

I will give just a few examples and some figures: from 6 to 9 June 2024, 400 million Europeans will cast their votes to elect the new Parliament (five-year term). This election is regarded as the “widest” democratic election in the world. In the United States, about 160 million citizens will choose their 60th President. In Russia, which votes on 17 March, Putin’s re-election is more than likely. Finally, the Indian elections in April–May 2024, with more than 900 million voters out of a population of 1.4 billion, will be the “largest” in the world.

These 2024 global elections will be pivotal to humankind, as they may entail many risks for future geopolitical orders and for a number of crucial aspects: conflicts, future alliances, environmental policies, and economic crises. This is why it is fair to refer to a turning point for our planet in the next two or three years, apart from and well beyond natural disasters risk alone.

To conclude this leader article, I would like to draw our readers’ attention to a paper (published in this issue of our journal) by Professor Rinaldo Genevois, entitled “*La Geologia Applicata sul filo dei ricordi*” (Engineering Geology on the Thread of Memories). It is taken from a lecture given by Prof. Genevois at Sapienza University of Rome in June 2022, on occasion of his 80th birthday. I am doing so because this paper is an outstanding essay on the role that “engineering geology” has played in the history of humankind. And yet, it was not until a few years ago that this discipline acquired the role that it deserved in the professional world and full

standing among technical-scientific disciplines of high societal value. Hence, this paper is a useful memory exercise about the origins and evolution of engineering geology both in Italy and on the international scene. Additionally, as we are currently discussing the skills and areas of expertise of geologists and engineering geologists, it is worth recalling that, in 1970, the International Association of Engineering Geology (IAEG) established the following definition of Engineering Geology: “*Engineering Geology is the science devoted to the investigation, study and solution of engineering and environmental problems which may arise as the result of the interaction between geology and the works or activities of man, as well as of the prediction of and development of measures for the prevention or remediation of geological hazards. Engineering Geology embraces:*” he applications/implications of the geomorphology, structural geology, and hydrogeological conditions of geological formations; “*the characterisation of the mineralogical, physico-geomechanical, chemical and hydraulic properties of all earth materials involved in construction, resource recovery and environmental change; the assessment of the mechanical and hydrological behaviour of soil and rock masses; the prediction of changes to the above properties with time; the determination of the parameters to be considered in the stability analysis of engineering works and earth masses.*”

Having given this definition, representing the cornerstone of Engineering Geology at international level, it remains only to wish you a stimulating read.